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Parent Page

How Can You Evaluate Whether a Program is Research Based?

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NRCLD developed this brief to help you understand the terms used in your son's or daughter's school. This understanding, in turn, can help you determine whether to support instructional changes proposed for your son or daughter.

Bell bottoms, the Macarena dance, Beanie Babies—each is a fad that has come and gone and may even turn up again. School program development, too, can be subject to fads; unfortunately, educational fads don't necessarily deliver improved teaching and student achievement.

The benefit of selecting educational programs based on proven research is that they can deliver what is promised if they are implemented as intended. These research-based educational programs are like the medicine that your physician prescribes. Improvement in the medical condition requires that the medicine be taken as prescribed. These educational programs have been tested, have produced desirable results, and then have been retested to make sure the same results happen again. The term "research-based" appears in connection with many practices and programs. The questions that have to be asked about these "research-based" claims are, first, "Are they really based on scientific principles?" and, second, "How well were these studies done?"

To better equip yourself to answer these questions, you will need to understand some of the terminology associated with scientific research. Research studies vary widely in how scientifically they were conducted. You need to understand research methodology before giving support and making any commitment to instructional changes.

Methodology

Quality research design starts with a review of what other experts have done in the field. Then, researchers decide the study's *methodology*—how the study will be done, who is going to participate, where the study will be conducted, what procedures will take place, what questions will be answered, and how the results will be judged.

Variables

Researchers focus on *variables*, those factors that change on purpose within a research study and those factors that the researcher hopes will *not* change or affect the results of the study.

The *independent variable* is the one that is changed on purpose by the researcher. An independent variable might be a learning program, a new intervention, or a way of teaching. The independent variable is also known as the "cause."

The effect, or the part of the study that appears, disappears, or changes as a result of the intervention (independent variable) is the *dependent variable*, often a measure of performance. The effect may be contaminated when a third, typically unmeasured and unwanted, variable enters the process. This *confounding variable* could be age, interest, motivation, teacher experience, time of day, or other factors. Researchers try to recognize and control for these confounding variables to the greatest extent possible.

Experimental Control

Experimental control, identifying what caused change in the dependent variable, is another often-used term. For example, if students participating in a study designed to teach them a reading skill do well on this skill when, and only when, they had received instruction on it, this is a demonstration of experimental control.

Replication

One of the best ways to check a study's validity is to have it done again—*replication*. If you or others follow the same process and produce similar results, then the study results are more likely valid. One way to do this is to test how well the innovation can be replicated in the school. It's not enough to think of the innovation as a framework or an approach or to use just parts of it. The replication should be done using the same methods, because if they are changed much, then the results will change.

Quality Results

After results of the study are produced, observed, and recorded, researchers analyze them to see whether any predictable patterns, associations, or differences appear and what the results actually mean. The quality of this interpretation depends on the adequacy and appropriateness of the evidence.

Some of the results' quality stems from *reliability*. For example, a student tested with a reliable assessment would get a similar score if the same or similar test were given again under the same conditions. *Interobserver reliability* refers to how similarly two people separately rate the same behaviors. If one observer records a certain behavior as occurring, the second observer also should record that as happening. The higher the level of interobserver reliability that a study has, the more believable the study results.

Another aspect of evidence quality is *validity*. Validity, or the degree to which a score represents what it was intended to measure, can be assessed by answering the following two questions: "Did the measurement system accurately measure what it claimed to measure?" and "Did the results provide an answer to the research question?"

Other Quality Measures

How else can you determine the quality of a "research-based" claim? *Journals*, which are the publications in which researchers publish, typically are peer-reviewed, which means that each submitted article is examined by fellow researchers who analyze the scientific progress. If research lacks the necessary rigor, the journal will not publish the study. So, if a study appears in a peer-reviewed journal, most of the judging has been done for you.

Another way to examine the research quality is to *talk to researchers* directly and question them, especially on how their approach would work in your school. You also can talk to other researchers and ask them their opinion of a study's promised results.

Although understanding how research is done well involves much more than this quick summary, this brief provides a good start. Knowing the basic process and some of the terms used in scientific studies will help you better analyze interventions used in your son's or daughter's school.

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